

DETAILED ACTION

Election/Restrictions

1. Claims 18, 20-25, 37, and 38 are directed to an allowable product. Claims 26 and 28-36, directed to the invention(s) of method of manufacturing a separator, an electrochemical system, and a process of using a separator have been amended to require all the limitations of an allowable product claim, and thus have been rejoined.

Because a claimed invention previously withdrawn from consideration under 37 CFR 1.142 has been rejoined, **the restriction requirement between groups I-IV as set forth in the Office action mailed on 1/22/2010 is hereby withdrawn.** In view of the withdrawal of the restriction requirement as to the rejoined inventions, applicant(s) are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Donald A. Schurr (#34247) on 10/14/2011.

The application has been amended as follows:

CLAIMS:

Claim 26 was amended to:

A method of manufacturing a separator for electrochemical systems comprising: providing a first conductive plate having a face and defining a plane and a second conductive plate having a face;

each plate including a series of projections extending outwardly therefrom, each of the projections having a corresponding cavity defined on the opposite side thereof in the face of the respective plate, the cavities of the first plate being dissimilar in shape from the cavities of the second plate;

the projections on the first plate being discrete and spaced from one another in a distributed manner over the face of the first plate defining a region having a periphery such that the cavities on the face of the first plate form no continuous channel entirely within the plane of the first plate and linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate;

one or more cavities on the second plate forming at least one connecting passage between discrete and spaced apart cavities on the first plate;

bringing the first conductive plate and the second conductive plate into an overlapping relationship facing one another, engaging at least a subset of the

cavities of the first plate with at least a subset of the cavities of the second plate, thereby providing at least one flow path between the first plate and the second plate; and
joining the first conductive plate and the second conductive plate.

Claim 30 was amended to:

An electrochemical system including: a first fuel cell, a second fuel cell and a bipolar plate; said bipolar plate being interposed between the first fuel cell and the second fuel cell;

the bipolar plate comprising: a first conductive plate having a face and defining a plane; and a second conductive plate having a face;

wherein each conductive plate includes a series of projections extending outwardly therefrom; wherein each of the projections have a corresponding cavity defined on the opposite side thereof in the face of the respective plate; and wherein the cavities of the first plate are dissimilar in shape from the cavities of the second plate, the cavities of the first plate forming no continuous channel within the first plate linking one edge of the plate with another edge of the plate;

wherein when the faces of the first and second plates are brought into an overlapping relationship facing each other, at least a subset of the cavities of the first plate engage a subset of the cavities of the second plate to provide at least one flow path between the first plate and the second plate;

wherein the projections of the first plate are discrete and spaced from one another in a distributed manner over the face of the first plate defining a region having a periphery such that the cavities on the face of the first plate form no continuous channel entirely within the plane of the first plate and linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate, the projections of the first plate defining a flow path for distributing a fuel medium on the anode side of the first fuel cell;

wherein one or more cavities on the second plate form at least one connecting passage between discrete and spaced apart cavities on the first plate; and

wherein the projections of the second plate define a flow path for distributing a medium on the cathode side of the second fuel cell.

Claim 33 was amended to:

The process of using a separator in an electrochemical system including the steps of: providing at least one separator having a first conductive plate having a face and defining a plane and a second conductive plate having a face; each plate including a series of projections extending outwardly therefrom, each of the projections having a corresponding cavity defined on the opposite side thereof in the face of the respective plate, wherein the cavities of the first plate are dissimilar in shape from the cavities of the second plate and,

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within the first plate, wherein the cavities on the first plate are discrete and spaced from one another in a distributed manner over the face of the first plate defining a region having a periphery, such that the cavities on the face of the first plate form no continuous channel entirely within the plane of the first plate and linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate;

one or more cavities on the second plate forming at least one connecting passage between discrete and spaced apart cavities on the first plate; bringing the first conductive plate and the second conductive plate into an overlapping relationship facing one another, engaging at least a subset of the cavities of the first plate with at least a subset of the cavities of the second plate, thereby providing at least one flow path between the first plate and the second plate; and

joining the first conductive plate and the second conductive plate;

installing the at least one separator in an electrochemical system; and

providing a media on a first side of the separator and providing a media on a second side of the separator.

Allowable Subject Matter

3. Claims 18, 20-26, and 28-39 are allowed.

The following is an examiner's statement of reasons for allowance: The invention is directed to a separator for electrochemical systems, a method of manufacturing said separator, an electrochemical system incorporating said separator in the form of a bipolar plate, and a process for using said separator. The separator comprises, among

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other things, cavities on the face of the first plate form no continuous channel entirely within the plane of the first plate and linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate.

Regarding new claim 39, the separator comprises, among other things, cavities on the face of the first plate form no continuous channel linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate without the cavities on the second plate.

The closest prior art is considered to be Gibb et al. (US 2003/0194595) and Funatsu et al. (US 2002/0168562). The closest prior art, taken alone or in combination, does not disclose, teach, suggest, or render obvious the claim limitations: (1) "cavities on the face of the first plate form no continuous channel entirely within the plane of the first plate and linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate" and (2) "cavities on the face of the first plate form no continuous channel linking one edge of the periphery of the region of the face of the first plate with another edge of the periphery of the region of the face of the first plate without the cavities on the second plate".

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN G. LEONG whose telephone number is (571)270-1292. The examiner can normally be reached on M-Th 8:00 AM - 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. L./
Examiner, Art Unit 1725
10/17/2011

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 1725